Section 1
Description of Water System

Every day, approximately 1.3 million people use water from Seattle's water system. This Water System Plan (WSP) reflects Seattle Public Utilities' (SPU) continued commitment to providing a safe and reliable water supply for residents of the City of Seattle and other water systems that obtain water from Seattle.

While the policies of the 1993 Water Supply Plan (SPU 1993a) will continue to provide broad guidance for decision-making within the utility, this WSP updates information contained in that plan. This WSP Update focuses on issues related to SPU's existing water sources, treatment, and transmission system, as well as the distribution system within SPU's retail service area. The development of new regional supplies and evolving arrangements among the region's water providers to meet growing regional demands are addressed to the extent that they relate to providing service to SPU's retail and wholesale customers. The discussion of SPU's regional role in the Introduction describes SPU's role as a major water supplier.

1.1 Ownership and Management

The City of Seattle owns and operates a public water system which serves customers both inside and outside of the Seattle city limits. Specific data about the system can be found in the Water Facilities Inventory (WFI) in Appendix 1-A that SPU files annually with the Washington State Department of Health (DOH). Information from WFI is summarized in Table 1-1.

Table 1-1
Water System Information

Water system name:	City of Seattle
Water system ID No.:	77050Y
Water system classification:	Group A- Community Type
Type of ownership:	Municipal (city government)
System contact person:	Julie Hutchins, Senior Water Quality Engineer
Service area population:	594,800 retail population 686,600 wholesale population
Number of direct service connections:	151,230 Single-family (includes duplexes) 22,054 Multi-family/commercial/government/education 123 Wholesale 1 Master Meter

The Seattle regional water system is administered according to Seattle City Charter, Article IV, Section 14 and Seattle Ordinance #118396. Numerous Seattle Municipal Codes also direct how the utility conducts business. These laws and codes contain authorization to function as a utility as well as regulations and procedures applicable to water system management and financial operation.

1.1.1 Administrative Structure

Seattle's water, drainage, wastewater, and solid waste utility services were consolidated administratively into a single entity known as SPU in 1997. The consolidation provides ease of access, simplicity of communications through one-call handling of service requests, and coordinated emergency response. Bringing several utility functions under a single management structure has reduced unnecessary redundancy and specialization. Exhibit 6-1 in Section 6 displays SPU's organizational structure.

SPU contains five branches. Each branch is headed by a Branch Executive who reports to the Managing Director. The responsibilities of each branch are discussed in Section 6.

SPU's Managing Director administers SPU in accordance with policies established by the Mayor of Seattle and the City Council. The Managing Director's Office provides overall management and policy direction, and coordinates internal and external communication.

1.1.2 Financial Structure

Within SPU, there are four separate funds: the Water Fund, the Drainage and Wastewater Fund, the Solid Waste Fund, and the Engineering Services Fund. The financial structure and accounting procedures of SPU are designed to preserve fund integrity so the revenue and cost streams for each of the utility systems and service functions are assigned to the proper fund.

1.2 History of Seattle's Water System

Three new pipelines were added to the Cedar River system between the years 1909 and 1954, allowing the system to meet the City's growing need for water.

Beginning in 1901, the Cedar River was developed to provide water to the City of Seattle. A transmission pipeline was constructed to deliver water from a diversion on the Cedar River at Landsburg. In addition, a timber crib dam was constructed at Cedar Lake (later renamed Chester Morse Lake). In 1914, Masonry Dam was completed approximately 2 miles downstream of the timber crib dam. The Cedar River remained Seattle's only water source for more than half a century. Three new pipelines were added to the Cedar River system between the years 1909 and 1954. This allowed the system to meet the City's growing need for water.

In the late 1950s, the Seattle water system became a regional resource, as suburban communities within King County began looking to Seattle for their water supply. The South Fork Tolt River was tapped as a source of supply in 1964, providing additional water supply and improving reliability to northern parts of the service area. In 1969, a transmission pipeline was constructed from the base of the Chester Morse Dam to supply the Sallal Water Association.

The Highline Wellfield was developed beginning in 1987 to provide water during the peak demand season. The Tolt 2 pipeline is currently being constructed to increase the available capacity of the system and to provide redundant transmission capacity from the Tolt supply.

Today, SPU serves approximately 1.3 million customers in the City of Seattle, other communities in King County, and a small part of southwest Snohomish County. Serving SPU's retail and wholesale customers requires an annual average of about 150 million gallons per day (MGD). The Cedar River continues to be the largest single source of water, providing approximately 70 percent of the water needed. The South Fork of the Tolt River provides about 29 percent. The Highline Wellfield provides summer flows that are calculated to be about 1 percent of annual available supply. In addition, conservation provides SPU with a strategy for meeting seasonal demands as well as a means to use existing supplies more efficiently to delay development of new sources.

A more detailed history of the system is presented in the 1993 Water Supply Plan.

1.3 System Description

This section provides an overview of SPU's major source and transmission facilities. A map displaying these features is provided in Exhibit 1-1. A full inventory of utility facilities can be found in Section 3.

1.3.1 Sources of Supply

The Cedar River Watershed is almost entirely owned by the City of Seattle.

Cedar River. The Cedar River Watershed is located in the Cascade Range, within southeast King County. The watershed encompasses 90,495 acres and is almost entirely owned by the City of Seattle. The remaining small portion of the watershed, 238 acres, is privately owned in small parcels with numerous different owners. In this watershed, Chester Morse Lake serves as a large reservoir with 15.8 billion gallons (48,500 acre-feet) of usable storage above the Lake's natural gravity outlet. It also provides additional high quality water from below its natural outlet that can be used during years of low water supply.

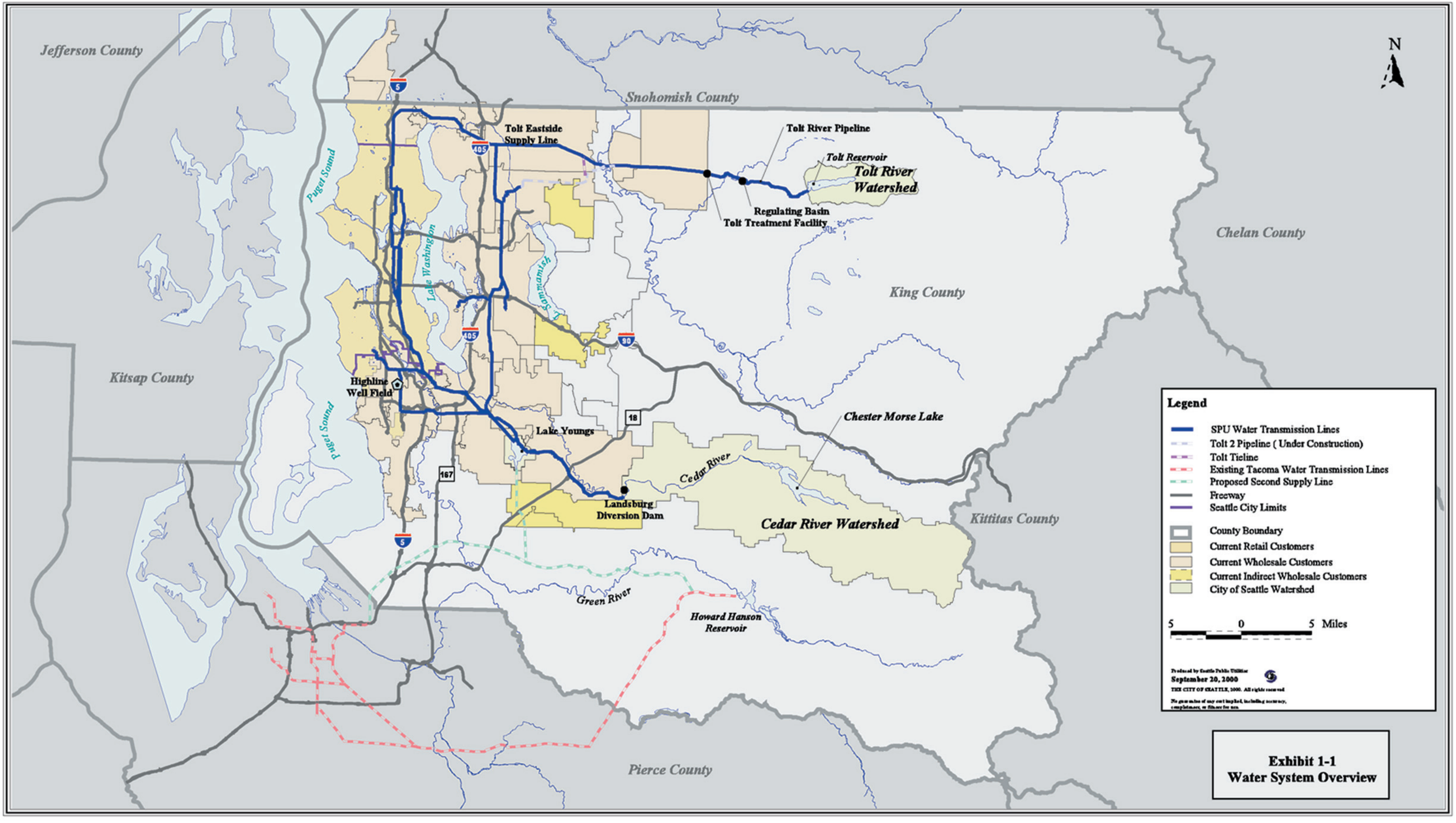


Exhibit 1-1
Water System Overview

Water stored in Chester Morse Lake flows downstream to the Landsburg Diversion Dam, which is located about 25 miles southeast of downtown Seattle. Here, water is first treated for entry into SPU's transmission system. Treatment consists of screening, chlorine disinfection, and addition of fluoride for dental health.

From Landsburg, water from the Cedar River system flows through pipelines to Lake Youngs Reservoir. This reservoir serves as a transmission storage reservoir for the Cedar River system to maintain appropriate pressure levels for customers throughout the service area. It has a usable storage capacity of approximately 1.5 billion gallons (4,600 acre-feet) at the minimum operating elevation of 486 feet. Water from Lake Youngs is re-chlorinated with gaseous chlorine, is pH adjusted with lime, and is then distributed by transmission pipelines.

The new Tolt filtration and ozonation water treatment facility is scheduled for completion by the end of 2000.

South Fork Tolt River. The Tolt watershed is located about 13 miles east of Duvall in King County. The City owns approximately 69 percent of the watershed lands. The U.S. Forest Service owns the remaining part of the watershed. The South Fork Tolt Reservoir provides 18.3 billion gallons (56,160 acre-feet) of storage. Water from this reservoir is conveyed to the Regulating Basin which regulates pressure in the system. At the outlet of the Regulating Basin, there is a treatment facility, which includes processes similar to those described above for the Cedar River source. The existing Tolt water treatment facility will soon be replaced by a new filtration and ozonation facility, scheduled for completion by the end of 2000. Following treatment, water from the Tolt River source enters the transmission system, with pipelines ranging in size from 54-81 inches, for delivery to north Seattle and utilities located on the north and east sides of Lake Washington.

Seattle operates a small Wellfield in the Highline area of South King County to provide peaking capacity.

Highline Wells. In addition to the major supply sources, Seattle operates a small Wellfield in the Highline area of South King County to provide peaking capacity. Consisting of three wells, this source can provide up to 10 MGD in peaking capacity. Groundwater from this source does not require disinfection. However, the water is treated with chlorine for residual maintenance, fluoride, and minerals to make it compatible with water from SPU's surface water sources.

The Highline Wellfield is equipped with unique recharge capability. Artificial recharge, or aquifer storage and recovery (ASR), uses drinking water from the Cedar River source, and delivers water to the Highline production wells via Cedar River Pipeline No. 4, to supplement natural recharge into the aquifer. Water is injected by gravity at a rate of approximately one-half the well's production capacity; for the Highline Wellfield the maximum allowable rate is approximately 5 MGD. The recharge period depends on water availability in the Cedar River, extending from October through May. The objective is to return the

piezometric head in the production aquifer to pre-project levels by the end of May each year. Withdrawals, as needed, would commence in mid to late summer.

1.3.2 Source Protection

Environmental stewardship is an important component of SPU's water management activities on the Cedar and Tolt Rivers. The provision of beneficial instream flows to protect aquatic resources downstream is a cornerstone in the Utility's efforts to protect salmon and steelhead trout populations. The effects of stream flow on salmon and steelhead in the Cedar and Tolt Rivers have been studied for many years. Recent collaborative efforts with state, federal and tribal fisheries resource managers have resulted in the implementation of protective instream flow management practices in both rivers. These efforts are complemented by additional habitat and fish population protection measures that are being implemented by SPU and others in cooperative regional efforts to protect and restore salmon and the ecosystems upon which they depend.

A broad array of instream flow protections are provided by the Cedar River Watershed Habitat Conservation Plan and the South Fork Tolt River Settlement Agreement. In addition, SPU works collaboratively with state, federal and tribal resources managers on a real-time basis to monitor conditions in the watershed, conduct additional biological studies, and adaptively manage stream flows for the benefit of aquatic resources.

A description of SPU's wellhead protection plan for the Highline Wellfield is included in Section 5 of this WSP.

1.3.3 Transmission, Storage, and Distribution Systems

The transmission system consists of a series of large-diameter transmission pipelines which deliver water to wholesale and retail customers throughout the regional service area. Water from the Cedar River flows through four Cedar River Supply Lines. Three of the pipe lines carry water into Seattle. The fourth pipe supplies the area to the southwest of Seattle and branches to supply the area east of Lake Washington through the Cedar Eastside Supply Line (CESSL), which extends to the Tolt Eastside Supply Line (TESSL).

The Tolt supply flows through Tolt Pipeline No. 1, portions of Tolt Pipeline No. 2, the Tolt Tieline, and TESSL for delivery to retail customers in the north part of the service area and to Eastside and North End wholesale customers. The section of Tolt Pipeline No. 2 between the Tolt Regulating Basin and the Tolt Treatment Facility (Phase 6b) will serve as the raw water pipeline to the new Treatment Facility. Another section of Tolt Pipeline No. 2 starts from the TESSL, extends northeast across the Sammamish River and through Redmond (Phase 1). A new

section of Tolt Pipeline No. 2 is currently under construction (Phases 2 and 3), and will connect the section ending in Redmond with Tolt Pipeline No. 1 near Duvall. The Tolt Tieline connects Tolt Pipelines 1 and 2 west of the Snoqualmie River along 232nd and 236th Avenues NE, which enhances the reliability and capacity of the Tolt transmission system.

Taps off of the major supply transmission pipelines from the Cedar and Tolt sources deliver water to purveyor master meters. Purveyors operate their own distribution systems serving retail customers.

The retail distribution system requires more than 1,800 miles of distribution pipeline, primarily four to 12 inches in diameter. Seattle's retail water distribution system includes nine open and six covered reservoirs spread throughout its service area, 39 pump stations with a total of 96 individual pump units, 13 secondary disinfection stations, and 16 elevated tanks and standpipes.

1.4 Related Plans

1.4.1 Coordinated Water System Plans

Within King County there are four "Critical Water Supply Service Areas" as defined by the State's Public Water System Coordination Act of 1977 (RCW 70.116). These geographical areas, East King County, South King County, Skyway/Bryn-Mawr, and Vashon Island are required to develop Coordinated Water System Plans (CWSPs). Three of these CWSPs are developed in areas served by the SPU regional water system, including: East King County, South King County and Skyway/Bryn Mawr.

SPU strives to achieve consistency between the provisions of purveyor CWSPs and its own WSP by working in coordination with the regional water associations.

SPU strives to achieve consistency between the provisions of these CWSPs and its own WSP by working in coordination with the regional water associations responsible for developing these plans. Elements that require careful consideration in order to achieve consistency include the boundaries of utility service areas, demand forecasts for the wholesale service area, and future water supply options.

The individual CWSPs require different levels of participation from SPU. The current East King County CWSP (EKCWRA, 1998) was updated and approved in 1998. SPU was especially involved in updates to the demand forecasts, modifications of the conservation element, and the identification of water supply options to make the CWSP and the SPU WSP consistent.

The current South King County CWSP (SKCRWA, 1989) has not been updated since the original was produced in 1989. SPU was less involved in this CWSP because SPU delivers water to few wholesale customers in the South King County Critical Water Supply Area. However, now that Covington Water District is a SPU customer, it will be more important for SPU to track developments in this area. SPU staff maintains regular

contact with the South King County Regional Water Association on issues involving SPU's WSP.

SPU was extensively involved in the development of the Skyway CWSP (Penhallegen, 1999) since SPU serves a substantial portion of the zone and local purveyor water districts. The Skyway CWSP was updated in 1999. SPU's involvement resulted in this CWSP addressing some service area and distribution system issues. The Skyway Water District merged with Bryn Mawr Water & Sewer District and became the Bryn Mawr-Lakeridge Water & Sewer District.

1.4.2 Wholesale Customer's Individual Water System Plans

Exhibit 1-2 shows the locations of utilities that purchase some or all of their water wholesale from SPU. Each year about three wholesale customers update water system plans covering their own systems, and submit them to DOH. SPU staff work closely with these customers so that their WSPs are consistent with SPU's WSP. This includes:

- Review of water supply planning, transmission, and water quality;
- Review of demand forecasts so that potential overlaps of population forecasts among Seattle and the various wholesale customers are minimized; and
- Review of responsibilities that are distinct from those services provided by SPU, such as main flushing and distribution-system monitoring.

SPU also undertakes additional coordination with its wholesale customers. For example, SPU has been working with the wholesale utilities to install or increase storage capacity in their own distribution areas, as a way to regulate flows in the transmission pipelines during the peak demand season. SPU will continue working closely with wholesale customers to coordinate regional water supply planning activities.

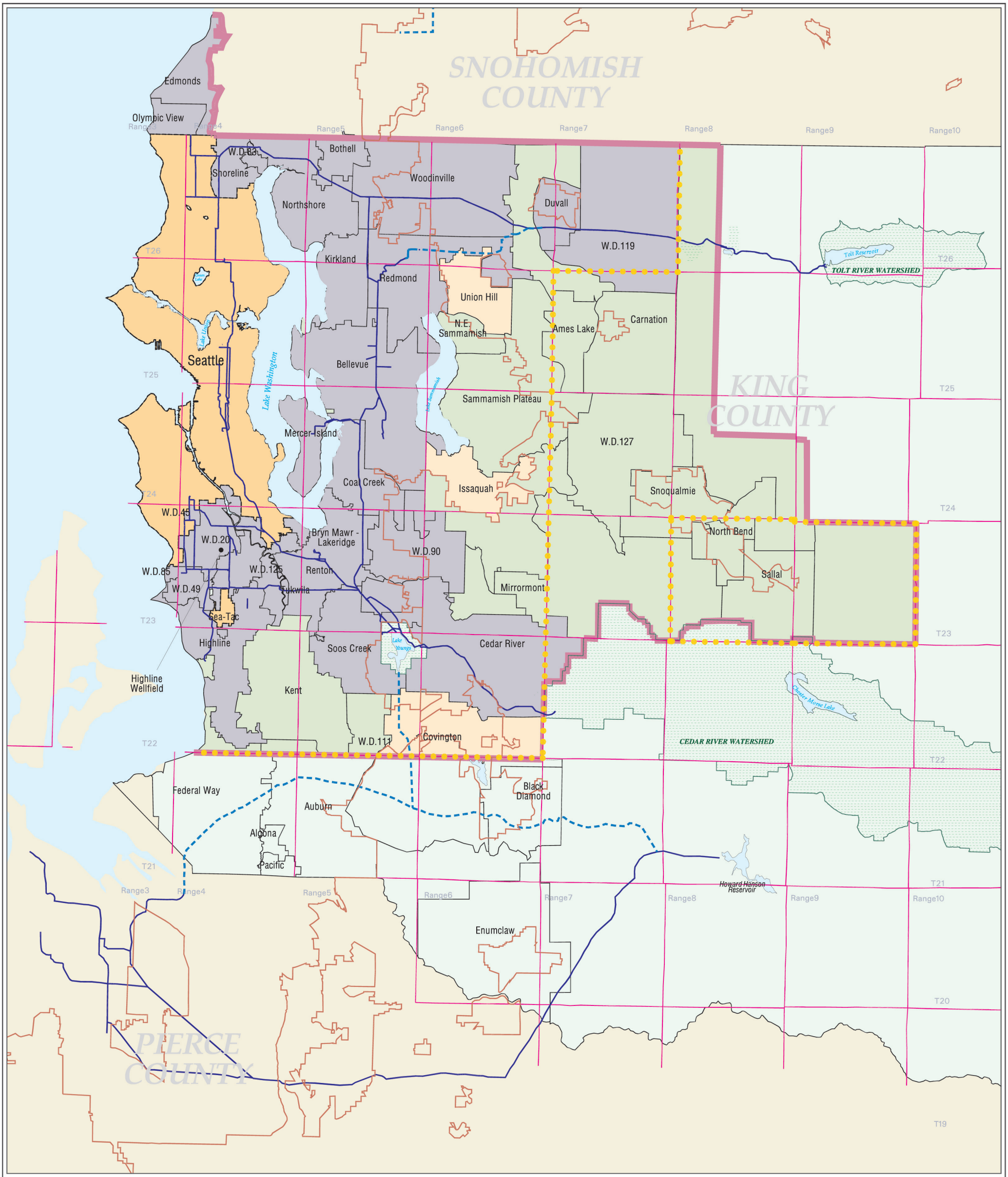
Each purveyor has responsibility for the distribution of water within its service area boundary. SPU is responsible for distributing water to its retail customers, within the City of Seattle, parts of Shoreline and Lake Forest Park, and a very small, unincorporated area south of the city limits.

1.4.3 King County COMPLAN

SPU will continue to work with the County to ensure consistency between the WSP and the County Comprehensive Plan.

The King County Comprehensive Plan (COMPLAN) (King County, 1994) defines where water utilities should be planning for future growth in unincorporated areas. During the development of the 1994 County COMPLAN, SPU and King County staff worked together to be sure that growth targets within the SPU service area matched the availability of water supply to serve related demand.

Exhibit 1-2: Seattle Public Utilities Service Area



Supply/Transmission Line
Cedar River Water Claim
Wholesale Customer Ultimate Service Boundary
Watershed Boundary
Urban Growth Boundary
Service Area 2001 WSP

Retail Customers
Direct Wholesale Customers
Indirect Wholesale Customers
Potential Wholesale Customers

Outside Service Area
Watershed Area
Township Boundary

N
S

Scale in Feet
0 11000 22000

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King County is currently in the process of updating its Comprehensive Plan. There is no expected change in the Urban Growth Boundary, and the updated population forecast by the Puget Sound Regional Council (PSRC) has not changed significantly. Thus, the COMPLAN update will likely have no significant impact on SPU's demand forecast and water supply planning in this WSP. Nonetheless, SPU will continue to work with the County to ensure consistency between the WSP and the County Comprehensive Plan.

1.4.4 City Comprehensive Plan

Seattle's city neighborhood and comprehensive planning interrelate with the WSP in regard to water distribution issues. Planned population increases and changes in land uses are important to how SPU conveys water throughout the distribution system. SPU must plan years in advance for capital investments for infrastructure capacity to meet future water demands.

During the development of the 1994 City of Seattle Comprehensive Plan (Comprehensive Plan) (Seattle, 1994), SPU staff participated in the analysis to assess whether the future development envisioned in the Comprehensive Plan posed any operational or infrastructure issue to the water system. At that time, SPU staff determined that existing and planned infrastructure in SPU's adopted Capital Improvement Program (CIP) was capable of meeting forecasted demands. SPU is currently participating in the update of the City's Comprehensive Plan.

1.4.5 Other Water System Plans

Tacoma. The Tacoma Draft WSP (Tacoma, 1998) is interrelated with this WSP because of the Tacoma Second Supply Project. As a new source that can meet growing water needs in the Seattle regional service area well into the future, it is discussed further in Section 4. The Tacoma Draft WSP outlines the project conceptually in its relation to the operation of the Tacoma system and the development of its second transmission pipeline from the Green River.

Adjacent Purveyors. There are six purveyors adjacent to the wholesale suppliers currently served by SPU that are not current SPU customers within the SPU service area. These are Lakehaven Water District, City of Kent, Mirrormont, Water District No. 111, Sammamish Plateau Water and Sewer District, and Northeast Sammamish Water District. Of these, Water District 111 is planning for SPU water in the future. As water system plans for these systems are developed and updated, SPU reviews them for compatibility and consistency in areas such as water supply demand forecasts, transmission needs, and water quality issues. Potential new

customers are discussed in Section 2. Interties with adjacent systems are discussed in Section 4.

The Central Puget Sound Water Suppliers' Forum is assessing the supply and demand picture for water utilities throughout King, Pierce, and Snohomish Counties.

Beyond the boundaries of SPU's service area, the Central Puget Sound Water Suppliers Forum is assessing the supply and demand picture for water utilities throughout King, Pierce, and Snohomish Counties. As its first task, the Forum determined the need to assess current and future water supply and demand for this highly urbanized region in the form of the Central Puget Sound Water Supply Outlook. As of mid-2000, the first part of the Outlook has been produced. It depicts demand forecasts and an inventory of sources of supply and infrastructure within the three county region. In its second phase, the Outlook will identify alternative regional supply solutions and alternatives to development of new sources. SPU is participating actively in this effort. Exhibit 1-3 displays the major water utilities throughout King, Pierce, and Snohomish Counties, as well as existing regional sources of supply and pipelines. While the details of the map are dynamic, it represents the regional water supply picture at this time.

1.4.6 Regional Wastewater Services Plan

The Regional Wastewater Services Plan contains proposals for disposal of the region's wastewater and development of reclaimed water as a new source of supply.

In 1998, King County published its Regional Wastewater Services Plan (RWSP) (King County, 1998). The RWSP contains proposals for disposal of the region's wastewater and development of reclaimed water as a new source of supply. In the plan, there are several possible uses identified for highly treated effluent to offset demand for potable water. SPU participated in the development of the RWSP and continues to work with the County in assessing the potential for water reuse, developing pilot projects, and other efforts as part of the King County Reuse Task Force.

1.4.7 Habitat Conservation Plan

SPU has developed and reached agreement with federal and state resource agencies on a 50-year Habitat Conservation Plan (HCP) for the Cedar River Watershed (SPU, 2000a). The Plan is designed to see that the watershed continues to serve its function of providing a high quality drinking water supply, while preserving the long-term health of the natural environment. The HCP also establishes guaranteed streamflows to protect various life-stages of all four species of anadromous fish which inhabit the Cedar River, including the threatened chinook salmon. The flows were designed to be conservative, in favor of fish protection, and yet preserve Seattle's firm yield for water supply purposes.

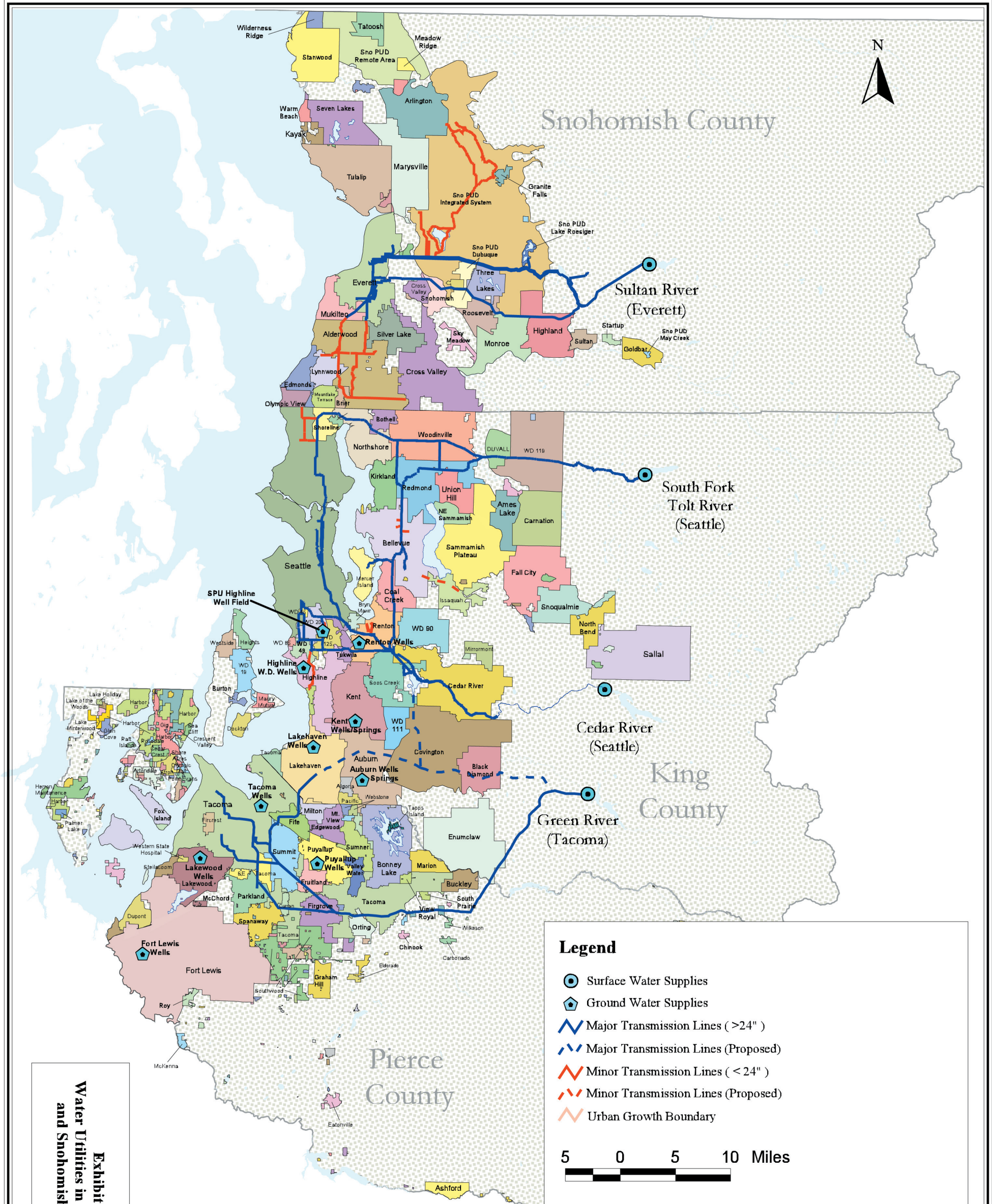

Exhibit 1-3
Water Utilities in King, Pierce, and Snohomish Counties.

As of September 2000, there is a pending legal proceeding related to the Cedar HCP. An action in superior court is seeking a judicial determination that the Department of Ecology lacked authority to make three specific commitments it made in the Instream Flow Agreement. The case is currently scheduled for trial in December 2000, but it is anticipated that it will be resolved through legal briefing, and without additional testimony. The validity of Seattle's Incidential Take Permit is not in question, and the relative certainty of the City's future water supply availability will not be materially affected by the outcome of this legal proceeding.

1.5 Existing Service Area Characteristics

SPU's service area includes current retail and wholesale customers as well as potential new wholesale customers. The map in Exhibit 1-2 shows these different customer types. While the terminology has changed since a service area map was first presented in a Water System Plan in 1980, the service area has remained unchanged.

Current retail customers are one part of the service area, which includes the City of Seattle, the City of Shoreline, a portion of Lake Forest Park, and a few small areas of unincorporated King County. Current direct wholesale customers include those municipalities and water utilities who have contracts with SPU to purchase water wholesale from Seattle.

Current indirect wholesale customers are utilities that receive water from the Seattle regional water system through a currently contracted SPU direct wholesale cusotmer. The service area in Exhibit 1-2 also shows potential wholesale customers who could directly or indirectly purchase water from Seattle in the future.

1.5.1 Retail Customers

SPU delivers water directly to approximately 594,800 retail customers.

SPU delivers water directly to approximately 594,800 retail customers through some 175,000 individually metered connections located in the City of Seattle and some areas immediately to the north and south, as well as a very small number of noncontiguous areas, including SeaTac International Airport and an apartment complex on Mercer Island.

This portion of the service area has remained fairly constant in geographic size for the past several years and is essentially defined by the adopted service area boundaries of neighboring utilities. Growth in the number of retail customers has been primarily the result of increased population density. This has occurred through development of vacant property or through conversion of single-family housing to multi-family.

The area serving retail customers is bounded by Puget Sound to the west, and Lake Washington to the east. To the south, as well as to the north, the retail portion of SPU's service area generally follows the city limits, and is bordered by the service areas of several water districts and suburban cities. One exception to this is in the northwest part of King County where retail service extends to 205th Street in the City of Shoreline and Lake Forest Park and beyond the City limit at 145th Street. This area was unincorporated until just a few years ago.

A zoning map showing development patterns within Seattle City limits is included in Appendix 1-B. The downtown core is heavily developed for commercial, retail, and high-density residential uses. A large industrial area is present in the Port area south of downtown, and along the Duwamish River corridor. Additional areas zoned for industrial uses lie north of downtown adjacent to Elliot Bay, extending to the Ship Canal, and around Lake Union. The area immediately east of downtown is developed with multifamily residences and commercially-zoned land. Extensive residential areas lie north of the Ship Canal to the northern city limits, between Interstate 5 and Lake Washington, and west of the Duwamish Corridor. Additional commercial development is concentrated along major thoroughfares designated for this type of use, and at commercial nodes throughout the City. In addition, Seattle is home to several major institutional facilities, such as the University of Washington main campus northeast of Lake Union and adjacent to Lake Washington, and numerous hospitals on Capitol Hill.

1.5.2 Geographic Conditions in Seattle's Retail Service Area

Topography and Elevation Ranges of the Service Area. The topography of SPU's retail service area is mostly hilly, with ground elevations ranging from sea level to an elevation of about 500 feet. This wide range of elevations results in the need for multiple pressure zones to keep service pressures within a desired range. There are areas within the SPU retail service area with up to four pressure zones.

Natural Barriers. Lake Union and the Ship Canal extend east-west and constitute a significant barrier to water lines running north-south. There are only four major water lines crossing the canal.

Freeways. Interstate 5 extends north-south across SPU's retail service area, thus forming a barrier for water lines running east-west. While several larger pipelines run across and under Interstate 5, most distribution lines end at the freeway. To a lesser degree, and much more localized, Interstate 90 and Highway 99 are also barriers to water lines.

Major Rivers. To the southwest two water pipelines cross the Duwamish River, a natural barrier separating West Seattle from the rest of the service area.

1.5.3 Wholesale Customers

There are 27 water districts and cities that purchase water directly from SPU.

There are 27 water districts and cities (purveyors) to the east and south of Seattle that purchase water directly from SPU to sell to their customers (Exhibit 1-2 and Table 1-2). In the wholesale areas, the water districts or utilities are responsible for delivering water to the customer's tap.

Table 1-2
Wholesale Customers

Bellevue, City of	Redmond, City of
Bothell, City of	Renton, City of
Bryn Mawr-Lakeridge Water & Sewer District	Shoreline Water District
Cedar River Water & Sewer District	Soos Creek Water & Sewer District
Coal Creek Utility District	Tukwila, City of
Covington Water District(1)	Water District No. 20
Duvall, City of	Water District No. 45
Edmonds, City of	Water District No. 49
Highline Water District	Water District No. 85
Kirkland, City of	Water District No. 90
Lake Forest Park Water District(2)	Water District No. 119
Mercer Island, City of	Water District No. 125
Northshore Utility District	Woodinville Water District
Olympic View Water and Sewer District	

(1) Signed contract 1999. Will be initiated when Covington requests service.
(2) Serves only as an emergency intertie.

Water purveyors serve a population base of nearly 687,000.

These water purveyors serve a total population of nearly 687,000 in year 2000. The part of the area serving direct wholesale customers has remained relatively constant since the mid-1960s, except for the 1987 addition of the City of Redmond in 1987 and Renton in 1997. However, the total population served has grown dramatically. An ongoing pattern of residential development, using previously undeveloped land, has been responsible for this growth. More recently, development occurring in the commercial, high technology, industrial, multifamily, and supporting governmental and institutional areas has also had an impact. This is particularly true in the more established areas of Bellevue, Redmond, Renton, Kirkland, and southwest King County, where the demographic character has become more similar to that of Seattle.

SPU's wholesale customers include both cities and special-purpose districts. A wide range of residential densities within the County is served. In addition, some of SPU's wholesale customers have highly developed urban lands, major industrial facilities, and significant institutional water users. Additional discussion of specific zoning and land use

characteristics associated with each wholesale customer is contained in the water system plans submitted independently by these public water systems.

Seattle has contracts with these purveyors that expire in 2012. Discussions are underway to secure new contracts. These talks aim at reaching terms for new contracts that will enable purveyors to continue receiving water from the regional water system after 2012. Topics in the negotiations include water supply, transmission, water quality, conservation, rates and planning. Several contract formats are being discussed that may provide different levels of services. They could range from full service, to just selling a block (fixed volume) of water, or a combination of different conditions. All of the contract variations are anticipated to be long-term (30-50 years), and would include clauses to address terms for future re-negotiations.

SPU is committed to finding agreeable terms to meet the future needs of all 27 current and future wholesale customers.

SPU is committed to negotiating as many contracts as are necessary to find agreeable terms to help meet the future needs of all 27 current wholesale customers and those added in the future. Current contract responsibilities for elements such as long-term supply planning may change as a result of the negotiations. The evolution of the Cascade Water Alliance, the Central Puget Sound Water Suppliers Forum and other regional developments could alter the planning outlook beyond 2012. Any changes would be reflected in future updates of the WSP.

1.6 Future Service

Wholesale providers are experiencing far more rapid and expansive growth than SPU is experiencing with retail customers. SPU's contractual commitment to meet water needs for wholesale customers extends to each purveyor's current and possible future service areas as defined in the East and South King County CWSPs (EKCRWA, 1998; SKCRWA 1999).

In addition to rapid growth, several utilities have begun to see their existing ground water systems reach capacity. Efforts to locate and develop additional supplies from local ground water sources have not been very successful. The South and East King County CWSPs recommended relying on either the Seattle or Tacoma regional water systems to meet these needs. Those plans concluded that local ground water would not support the additional growth anticipated. Furthermore, connection to a regional system would provide more reliable access to water needed to support existing and potential future customers.

Issaquah and Covington Water District recently arranged to get water from the Seattle regional water system.

The City of Issaquah and Covington Water District water supplies are reaching capacity. They recently arranged to receive water from the Seattle regional water system. Water provided to these utilities serves new growth in urban areas that are within their service boundaries.

Issaquah has been receiving water from the SPU regional water system through an intertie with Bellevue for a number of years. In 1999, Issaquah signed an agreement with Bellevue, which SPU approved, to purchase additional water that would come from the Seattle regional system. It allows Issaquah to purchase up to 1.7 MGD on an annual basis.

Covington Water District signed a contract directly with SPU in 1999. The contract will be triggered at Covington's initiative of requesting service. This agreement ensures that Covington will have enough water to serve growth in the District's Urban Growth Area (UGA). However, if the Tacoma Second Supply project comes on line by 2004, it is possible that Covington will not need water from SPU.

Several other utilities have initiated discussion with SPU about receiving water from the Seattle regional water system in the future. The utilities discussed here are referred to as potential wholesale customers. They include: Ames Lake, Water District 111, City of North Bend, and Sallal Water District. Water District 111 could become an indirect wholesale customer via Soos Creek or Cedar River Water Districts to get enough water to provide for anticipated growth in the District. North Bend could receive water through Sallal. There is an old connection from the SPU system to the Sallal system which could be reactivated and revamped to meet current water quality standards. Ames Lake could also potentially become a wholesale customer in the future. Getting water to those utilities from SPU's transmission system will be the responsibility of the wholesale utility.

All of these utilities are part of the service area defined in the 1980 and 1985 SPU WSPs. Issaquah, Covington, and Water District 111 are also shown in the 1993 Water Supply Plan since they identified themselves as being interested in being served by SPU in the near future.

The water rights for the South Fork Tolt River and Highline Wellfield use the service area defined in the 1993 Water Supply Plan in the "place of use" description. These utilities are also entirely or partly within the area identified in the place of use for the Cedar River water claim. Consequently, SPU water rights include the service areas of these utilities. Exhibit 1-2 shows the SPU service area with an overlay of the place of use of SPU water rights or claims.

1.7 Service Area Agreements

Service area agreements are developed between utilities so that customers

in a particular area are served by the most logical supplier depending on available connections and infrastructure. There are two areas, Skyway and Shoreline, to which SPU currently provides service, where the service areas could change in the near future.

Skyway. The Skyway area is one of four Critical Water Supply areas in King County. Several years ago, the Skyway Water Utility Coordinating Committee (SWUCC) formed and developed a plan identifying service areas. Participating water utilities included the City of Renton, City of Tukwila, Water District #125, SPU, Bryn Mawr-Lakeridge Water & Sewer, and Skyway Water & Sewer District (Skyway Water & Sewer District is now consolidated with Bryn Mawr-Lakeridge). That plan was updated in 1999 to redefine service area boundaries, identify overlapping areas, and define future service obligations. The update also included long-range plans for certain current Seattle connections within the service areas of SWUCC members, to be transferred to Bryn-Mawr-Lakeridge Water & Sewer.

Shoreline. Last year, SPU signed a contract with Shoreline Water District to transfer 37 customers that SPU served north of 145th Ave. The City of Shoreline will maintain the current water arrangement with SPU and Shoreline Water District providing service to Shoreline and Lake Forest Park residents in their previously established areas of the City.

1.8 Service Area Policies and Conditions of Service

SPU water service would be allowed only within the Urban Growth Area (UGA) or at rural levels of service outside the UGA.

The 1993 Water Supply Plan established a policy that SPU water service would be allowed only within the Urban Growth Area (UGA) or at rural levels of service outside the UGA. SPU will provide retail water service to anyone within its retail service area. Potential customers within the service areas of SPU's wholesale customers must obtain their water from the water utility designated to serve that area unless otherwise stated by mutual agreement.

Seattle is unlike many of its suburban neighbors in that there is not extensive growth within its retail service area. The City is primarily developed, with most new services resulting from redevelopment or development of scattered vacant lots. For this reason, some service issues such as annexation, service outside of the service area, and latecomer agreements, rarely become an issue. When they do arise, they are handled on a case-by-case basis and the Revised Code of Washington (RCW) is used to guide decisions related to situations such as these.

New service in the SPU service area is guided primarily by three policies:

- The Wholesale Water Service Policy (Appendix 1-C) establishes policy and general procedure for metered water services for wholesale customers within the SPU regional service area;
- The Retail Water Service Policy (Appendix 1-D) establishes policy and procedure for metered water services for retail customers;
- Design Standards for Distribution Water Mains (Appendix 1-E) establishes the policy for main sizes and requirements for materials to be used when retail customers install new water service.

All these policies will be summarized in the following sections. In addition to the three primary policies, there is the Standard and Administrative Charges policy and the Cross-Connection policy. The Standard and Administrative Charges is summarized here and in full text in Appendix 1-F. The Cross-Connection Control policy is discussed in Section 6.

1.8.1 Retail Water Service Policy

In keeping with the RCW and the Seattle Municipal Code, the Retail Water Service Policy allows for extension of new service in the area serving retail customers under varying conditions. Typically, the new service must abut a standard water main, although there are provisions in the policy for providing water service from non-standard or non-abutting water mains. Engineering, water availability, and economic reviews are required by the policy before new service will be approved. All new service must meet the design standards established by SPU.

The Retail Water Service Policy is based on the principle that developers, not ratepayers, pay the cost of new development infrastructure.

The Retail Water Service Policy outlines the responsibilities of SPU and customers in developing new connections to the system, including the process for extending service and financial obligations. It is based on the principle that developers, not ratepayers, pay the cost of required infrastructure for new development. In keeping with state law, each property in the retail service area will contribute in some form to the water system:

- Developers' properties may contribute by installing new water mains.
- Properties with existing or new water services may contribute by paying a Special Tap Charge to SPU.
- Properties to be served by a developer-installed water main may contribute to the developer's project in lieu of the Special Tap Charge.
- Properties may contribute via participation in a water main installed by a Local Improvement District (LID).

Developers may enter into a latecomer's agreement with SPU in certain cases. A latecomer's agreement allows developers to recoup a part of their costs by receiving a portion of the Special Tap Charge from properties connecting into the segment of water main installed by the developer within a 10-year period following installation.

This policy, in effect since 1983, is currently in the process of being revised and updated. Changes are being made to reflect the change in the utility's organization. This policy will also undergo some more significant changes and additions that will align the policy with current business conduct. SPU is planning to change its method of determining the amount and method of the developer's contribution to the water system when a property receives service.

1.8.2 Wholesale Water Service Policy

SPU has "full-service" 30-year contracts with 25 of its 27 wholesale customers (Table 1-2) that are in effect until year 2012. Two wholesale customers, the City of Renton and Covington Water District, have recently signed contracts with different terms. The full service contracts obligate SPU to make provision for the continuing requirements of water services for those wholesale customers. SPU does so on a cost-of-service basis. In general, the wholesale utility is responsible for delivering water from the service connection at the existing pipeline to the point of use. In some instances, a new pipeline or pipeline extension may be constructed by SPU, which may finance part or all the pipeline extension.

The Wholesale Water Service Policy requires that new wholesale connections be compatible with the SPU system.

The Wholesale Water Service Policy requires that any new wholesale connections be compatible with the SPU system. SPU determines the features, and normally installs the new connection. The policy identifies who shall own, operate, and maintain the connection. The policy establishes a flushing allowance, and identifies how water consumption charges will be applied. Billing procedures are also a part of the Wholesale Water Service Policy along with how disputes are handled. This policy has been in effect since 1984. It was reviewed in 1999 and minor changes were made which were finalized in early 2000. The policy is contained in Appendix 1-C. Each SPU wholesale customer establishes its own policies for handling new service within its service area.

1.8.3 Design Standards for Distribution Water Mains

The established City of Seattle Standard Specifications (Seattle, 2000a) and City of Seattle Standard Specifications (Seattle, 2000b), together with American Water Works Association (AWWA) standards (AWWA 1992-99), provide the basis for construction projects. Section 3 contains more information on standards.

SPU developed a series of information sheets in 1999 to assist developers in obtaining new water service. These describe developer responsibilities and the procedures they should follow. They also include sample permit and performance bond agreements, hydrant flow testing instructions, and an outline of standard charges. In addition to the information for the developer, there is a checklist for the developer's engineer which identifies the expectations for plans and drawings related to the new service. Information for the developer's contractor identifies their responsibilities, insurance requirements, use of hydrants and necessary measures related to water quality. Section 7 describes this in more detail and Appendix 7-A contains the developer's packet of information.

1.8.4 Standard and Administrative Charges

The Standard and Administrative Charges policy contains a listing of charges SPU requires for the services performed most frequently. In accordance with Seattle Municipal Code, each year SPU updates the charges based on the utility's average cost of performing each service during the previous year. For administrative ease and cost-effectiveness, charges are based on the "average" cost of the service rather than on exact time and material costs which would vary from job to job for the same task. Non-standard charges are billed using actual costs.

The Standard and Administrative Charges policy includes 30 types of charges. Some of these include:

- New service installation
- Water quality testing
- Charges for installing new services which vary based on size of service
- Charges related to billings
- Hydrant use fees for non-firefighting purposes
- Construction related fees.